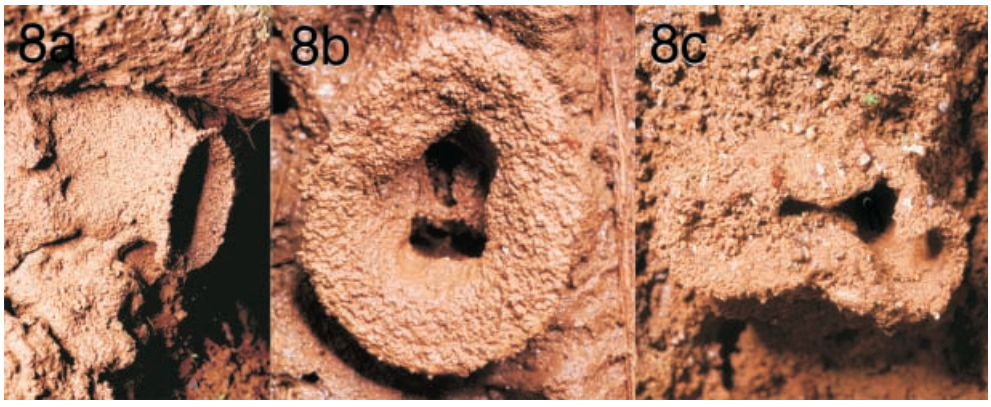

Figure 8. Nest entrances. (a.) *C. longiscapus* (Panama): "swallow's-nest" form. (b.) *C. longiscapus* (Panama): auricle form. (c.) *C. muelleri* (Panama)

NEST ARCHITECTURE (diagnosis): Nest entrance architecture differs enough between *C. longiscapus* and the new species to constitute a generally useful character for distinguishing between nests of the two species in the field. *C. longiscapus* constructs nest entrances of two kinds: the swallow's-nest type, reported from Colombia and Panama (Fig. 8a; Weber, 1972; Mueller and Wcislo, 1998), and the auricle type, reported from Panama (Fig. 8b). Auricle dimensions are summarized in Table 3. In *C. longiscapus,* nest entrance auricles are usually higher than wide (i.e., longer in the vertical than in the horizontal dimension), and auricles are strikingly flared, i.e., they are much broader across the rim than across the base.

Distribution: *C. longiscapus* is currently known from the wet forests of Colombia, Panama, and Costa Rica.

Paratypes examined (10 total): 2 workers (LACM), 4 workers (MCZ), 1 worker (MZSP, W.W. Kempf Collection), 1 alate gyne (MCZ), 1 dealate gyne (MCZ), 1 male (MCZ): Colombia: Rio Porce; 1020 m; nesting in rain forest; No. 1088; 3-viii-1938; N.A. Weber, coll.

Other (non-type) non-Panamanian specimens examined (14 total): 5 workers (LACM): Colombia: Choló Quebrada Bolindramá; 1968; Coll. Silverstone; LACM 43800; stomach contents *Phyllobates aurotaenia* (Amphibia); No. M29. 2 workers (LACM) and 6 workers (MZSP): Colombia, Valle; Anchicayá, Municipo Buenaventura; ca. 2000 m; rain forest, under rock in canyon; 19-vi-1971; W.L. Brown, Jr. collector. 1 worker (INBC): Costa Rica: Herédia; Est. Biol. La Selva; 50–150 m; 10°26′N, 84°01′W; Sept 1992; INBio-OET; INBio CRI001237776; Longino No. 3328; J. Longino, Collector. Snelling and Longino (1992) list a second Colombian series (LACM) from the stomach contents of the frog *Dendrobates histrionicus,* which was not located for this study.

Panamanian specimens examined: 931 workers (105 nests), 192 gynes (72 nests), and 180 males (49 nests); see Appendix.

Cyphomyrmex muelleri Schultz and Solomon, **new species**

HOLOTYPE (worker): Republic of Panama: Barro Colorado Island; 14 February 1996; U.G. Mueller, collector; Nest series: UGM960214–05. Measurements (in mm): HL=0.85; HW=0.65; WL=1.08; SL=0.79; hind femur length=1.02; greatest diameter of eye=0.17. USNM.

WORKERS (diagnosis): Measurements as in Table 2. Possessing 11 antennal segments and palpal formula 4, 2. Color ranging from yellow to testaceous to fuscous brown. Head and alitrunk uniformly foveate, each fovea usually surrounded by a circlet of whitish "bloom" that resembles the attine actinomycete symbiont (Currie et al., 1999a), the extent of this bloom highly variable across individuals as described above for *C. longiscapus.* Pilosity inconspicuous, fine, thin, silvery, and decumbent.

Keying out to *C. longiscapus,* to which it is very closely related, in the keys of Weber (1940), Kempf (1966), and Snelling and Longino (1992), and sharing with that species the uniquely elongate antennal scapes and weakly expanded frontal lobes. Distinguishable by the following criteria: Vertexal carinae (i.e., paired carinae on the vertex, running parallel to and on either side of the midline) vestigial or absent (in *C. longiscapus,* strongly produced) (Fig. 1b, VC). Dorsum of the alitrunk in lateral profile smoother and more continuous than in *C. longiscapus.* In particular, the metanotal groove ("mesoepinotal impression" of Kempf) obsolete, present only as a shallow transverse line (Fig. 2b, MG), so that, in lateral view, the dorsum of mesonotum and propodeum are continuous and uninterrupted by a deep suture such as is present in *C. longiscapus.* Third intersegmental groove of the thorax (separating the mesopleuron from the metapleuron) incomplete, present dorsally as the vestigial metanotal groove and laterally just above the coxae, but absent in between (Fig. 2b, IG); in *C. longiscapus* the groove is complete (Fig. 2a, IG). Posterior tubercles of the postpetiole produced into strong denticles (Fig. 3b, PT), noticeably protruding posterad such that the postpetiole is strongly posteriorly emarginate in dorsal view (Fig. 3b); in *C. longiscapus,* the postpetiole is weakly emarginate (Fig. 3a). Hind femur with a pair of strong ventral carina, forming a groove for the reception of the tibia and produced in the basal one-third into a strong ventro-posterior lobe (Fig. 4b, FL), apparently for the protection of the joint between the tibia and tarsus. The ventral femoral groove thus receives the tibia distally and the tarsus basally. Carinae and lobe absent in *C. longiscapus* (Fig. 4a, arrow).

The following characters are generally useful for distinguishing *C. muelleri* from *C. longiscapus,* but, because a minority of specimens in both species possess intermediate states, these additional characters are somewhat less reliable for the identification of *C. muelleri:* Whitish integumental "bloom" (actinomycete symbiont?), when present elsewhere on the body, also occurring within the antennal scrobe (usually absent in *C. longiscapus).* Frontal triangle usually laterally compressed, forming a narrow acute triangle or a linear impression (broad and finger-shaped in *C. longiscapus).* Posterior mesonotal tubercles absent or present as weak carinae (Fig. 2b, PT); usually well developed in *C. longiscapus.* Propodeal angle usually absent; the dorsal and declivous faces merged into a continuous curve; propodeal angle usually present in *C. longiscapus*.

GYNES (diagnosis): Measurements as in Table 2. As in the worker, possessing 11 antennal segments, palpal formula 4, 2, and the *C. longiscapus s.l.* worker/gyne characters of the elongate antennal scapes and weakly expanded frontal lobes. Color, sculpture, integumental bloom, and pilosity as in the workers.

Generally differing from *C. longiscapus* in the same character states as the workers except, obviously, for those of the alitrunk. Vertexal carinae vestigial or absent (Fig. 5b, VC). Postpetiole in dorsal view strongly